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ABSTRACT

This paper discusses public support for private education and educational vouchers in post-Communist Hungary and the Czech Republic, which support nonstate schools extensively. Although public schools were relatively good in these countries post-Communism, there was a surge in demand for private alternatives. The paper examines changing market incentives and traces the development of nonstate schools, as well as other education reforms, in these two countries since 1989. It notes factors influencing the establishment of nonstate schools, providing preliminary evidence regarding the role of such schools in expanding the range of opportunities for parents and students and in bringing pressure for reform to bear on the state school system. Private schools appear to have arisen in response to distinct market incentives. They are more common in areas where public schools are doing a poor job, as seen by the success rate of academic high schools in obtaining admission to the top universities for their graduates or of technical high schools in obtaining employment and high wages for their graduates. Preliminary evidence suggests that public schools facing private competition improve their performance. Preliminary evidence also supports the claims of advocates for nationwide voucher schemes. (Contains 25 references.) (SM)

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Public Support for Private Schools in Post-Communist Central Europe: Czech and Hungarian Experiences

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Introduction

Some of the most profound changes following the collapse of communism in Central and Eastern Europe occurred in educational systems. For generations schools had served not only as a means of training workers, but also as a vehicle of indoctrination designed to create a "new socialist man." Education was, by law, a state monopoly designed to respond to the dictates of the plan rather than the signals of the market. Very detailed curricula were prescribed by central authorities (Micklewright, 1999). Parental and student preferences played little, if any, role in determining how much or what type of training was provided. Entry into coveted disciplines, while certainly influenced by ability, was also heavily determined by political or other considerations. There are numerous examples of students with an interest in and aptitude for study in particular subjects being forced into entirely unrelated fields because they or their parents were considered politically unreliable.[1]

In such an environment it is not surprising that one of the first reforms of the transition process was to overhaul the educational system to provide greater flexibility and give far more substantial decision-making power to students and parents. One key reform involved allowing nonstate[2] schools to challenge the state education monopoly. Table 1 shows the extent of nonstate education in various Central European countries by the middle

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[1]One common technique was to offer university admission to the children of those in disfavor, but only in highly technical fields unrelated to their background or interests. Thus, a student who desired to study literature might be offered admission only to the faculty of mathematics. When the student was unable to pass, the authorities could say with a straight face that the student had not been denied access to education because of political considerations, while ensuring that they did not receive the benefits education conferred.

[2]We will use the term nonstate to refer to all types of education that is administered by non-government entities such as churches, foundations, profit making corporations and individuals. Schools operated by these entities may or may not receive funding from the state according to local laws and policies.

of the first decade after the collapse of communism. Several trends stand out. In most countries in the region, nonstate education has achieved only limited market share. In the Czech Republic, Slovakia and Hungary, however, the share of students in nonstate schools approaches that in closely related EU countries such as Germany and Austria.[3] It is not a coincidence that these three countries provide the most generous level of state funding for private and religious schools. In each, funding may be as much as 100% of that provided to government schools. Poland provides a subsidy to nonstate schools of approximately 50% of the funding given to state schools, while in most of the other countries of the region there is little or no public support for nonstate schools.

Since our task is to learn what we can about the impact of voucher-like schemes from the experience of Central Europe, we will limit the discussion below to those countries where there is extensive public support for nonstate schools. In addition, to keep the analysis tractable, we will ignore Slovakia which has a similar history to that of the Czech Republic and focus almost exclusively on the Czech Republic and Hungary. This paper traces the development of nonstate schools[4] as well as other education reforms in these two countries since 1989. It provides preliminary evidence regarding the role of such schools in expanding the range of opportunities for parents and students and in bringing pressure for reform to bear on the state school system.

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[3]It lags considerably behind the EU average of almost 16%. This average is heavily influenced by very high nonstate enrollments in countries such as France, Belgium and the Netherlands where the tradition is for each of several antagonistic linguistic or religious groups to operate independent school systems with state funding.

[4]Nonstate schools in the Czech Republic can be divided into two types, private and church sponsored. Among academic high schools, about 20 percent of nonstate schools are church related. The church-related share of other types of schools is much lower. In Hungary church affiliated schools comprise two-thirds of nonstate academic high schools but 7 percent of technical high schools and 15 percent of vocational (apprentice) schools.

A. Initial Conditions

The Czech Republic has a population of about 10.3 million people and an area of just over 30,000 squares miles. In area it is almost exactly the same size as South Carolina, while the population is close to that of Michigan. Overall, in terms of area, population, and density, one would do well to think of the Czech Republic as a close mirror of Ohio.

Administratively, prior to 2000, government functions were divided between the national government and 77 district or local governments.[5] (Recently regional governments have been introduced between the national and district governments but these did not exist during the period under study here.) Czech districts should be thought of as analogous to US counties in area, population and responsibilities. Studies of labor markets have found that there is surprisingly little commuting for employment across district boundaries, especially given the relatively small size of districts and the large differences in job opportunities (Erbenová, 1997). Mobility for employment was low even during communism and has declined further since 1990 (Andrle, 1998). Whether this is due to intense localism or poor transportation infrastructure, it suggests that there is also likely to be little commuting to attend schools that are in some way more attractive than those found nearby.

Hungary has a population of about 10.2 million in an area of slightly less than 36,000 square miles. Administratively, the country is divided into 19 counties and 8 cities of county status including Budapest. These administrative areas are on average, therefore, about three times the size of those in the Czech Republic.

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[5]There are actually a larger number of districts but we combine educational data combinefor all jurisdictions in Prague into a single metropolitan area. Thus, we have data for greater Prague plus 76 additional districts.

Both educational systems provide several paths that students can follow. In 1989 ten years of schooling was compulsory. Primary or basic education in the Czech Republic lasted for either eight or nine years. Talented students were allowed to apply for secondary education after eight years of primary school while others, particularly those who did not obtain their desired placement, remained for a ninth year. Then, as now, students applied for various types of secondary school depending on their future career plans, with admission to over-subscribed programs rationed on the basis of exam performance and other considerations. In Hungary primary education ended after eight years.

The lowest level of additional education available involves two years of vocational training.[6] High school education is divided into three types: vocational education leading to a certification exam, specialized secondary (technical) education in professional fields such as nursing and engineering, and general secondary education in academic high schools known as gymnázia. Students from secondary education may continue on to university although it is rare for those from vocational school to do so and the majority of university students come from academic high schools.[7] As elsewhere in the region, university education typically involves the study of a single field and lasts five years.[8] Students desiring the most advanced degree typically continue for another three years of post-graduate study.

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[6]Except for Czech students who sometimes studied only for one year if they remained in primary schools for the full nine years possible.

[7]In order to enroll in university students must leave secondary school with an exam credential known as a maturita. Whether or not a student receives this credential, and can therefore continue on to university studies, depends on their program or course of study. In the Czech Republic, all gymnázia and 96 percent of technical school programs, but only 14 percent of vocational school programs, lead to a maturita and the possibility of university admission. In fact, many vocation schools are three years or less in length and cannot provide the matruita required for university admission. There has arisen, therefore, a market niche for schools providing what is known as "addendum" programs to allow such students to qualify for university.

[8]In addition to university, there are so-called "higher professional schools" in some specialized fields that form an intermediate level of education between secondary and true tertiary education. These were legally established as secondary schools in the Czech Republic because the law on higher education did not allow for nonstate tertiary institutions before 1998.

Although educational levels were on average relatively high, the structure of education was highly skewed towards vocational and away from general academic training. In 1989-90 less than one-quarter of secondary students were enrolled in an academic, as opposed to technical, program in both the Czech Republic and Hungary. This percentage contrasts with slightly under half of secondary-level students in general academic programs in the average OECD country. In fact, in 1995 the Czech Republic had the lowest proportion of secondary-school students in general academic programs of any OECD country (OECD, 1997). Furthermore, the vocational education system is very specialized. There are over 300 separate "tracks" in the Czech Republic, compared with 16 in Germany, a nearby country with heavy emphasis on vocational training (Laporte and Schweitzer (1994)).

The legacy of the allocation system imposed by the planning authorities has resulted in substantial excess demand for various types of education (CEPR, 1998). In 1989 only 52 percent of those seeking university admission in the Czech Republic were offered at least one place. It is not possible to reconstruct from official data the success rate of students seeking admission to academic high schools.[9] It is widely understood, however, that more students seek admission to these schools than there are places available. Similarly, places in popular fields in technical and vocational high schools, especially those required for the expanding service sector, are severely rationed. Thus, there should be market niches that could be filled by entrepreneurial educational providers.

In addition, school systems in the Czech Republic and Hungary, as elsewhere in the region, have substantial weaknesses that may encourage parents to seek alternatives to public schools. In particular, the public school systems are overly focused on memorization rather

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[9]Data is reported on the number of applications and the number of acceptances but not on the number of applicants.

than creative thinking (Tomášek, et. al., 1997). Finally, some parents regard public schools with distrust, given their role in indoctrination under communism, a situation paralleling the attitudes of groups such as fundamentalist Christians in the U.S. Despite these weaknesses, overall the school systems provided strong education results, especially in scientific and mathematical fields where Czech and Hungarian graduates consistently tested among the best in the world.

Development of regional educational systems during the 1990s was driven by demographic trends as well as educational reforms. Table 2 shows the population at various ages in 1991 and 2000. It is clear that in both the Czech Republic and Hungary there were massive declines in birth rates during the final years of communism. Thus, at the start of the transition educational planers could foresee that the number of students of both primary and secondary school age would fall considerably over the decade. The number of children of high school age (between 14 and 17) fell by over 25 percent between 1991 and 2000 in the Czech Republic and over 30 percent in Hungary.[10] This demographic trend should have resulted in increased access to education over the decade even if there were no increase in educational spending or no new schools entering the market.

B. Educational Reforms Since 1989

[10]Although beyond the scope of this paper, we also note in Table 2 that the decline in Poland did not occur until several years after that in the Czech Republic and Hungary. Given this greater potential demand and the country's strong Catholic tradition, it is interesting to speculate as to why nonstate schools are less common in Poland than in nearby countries. One obvious answer involves the lower support provided to such schools in Poland, but this begs the question of why elected officials in Poland did not find it necessary to support nonstate education as extensively as their neighbors.

In addition to the possibility of nonstate schools, there have been several major education reforms in the Czech Republic and Hungary since the start of the transition that may have played a role in the rise of such schools.

In each country individual schools were given legal status and decision-making authority over enrollment and curricula. The setting of the number of students allowed to enter various disciplines by centralized State Planning Commissions was abolished. Schools and teachers were given substantially greater freedom to chose teaching methods and textbooks. Even though there are school leaving exams for most programs, the form and content of these exams was left to the discretion of individual schools. These reforms provided all schools, both public and private, with substantially increased ability to compete for students.

Prior to approximately 1992, all academic high schools were four-year programs. With the freedom allowed after 1989, a number of gymnázia began admitting students after the fourth or fifth or sixth year of primary school and revised their program so that it lasted between six and eight years. By the 1997/98 school year, these "extended gymnázia" accounted for over 40 percent of gymnázia students in the secondary-school years in the Czech Republic and about half that fraction in Hungary. There has been considerable discussion about the impact of this reform on primary schools. It is generally assumed that the more talented and academically motivated students leave basic school for the extended gymnázia, resulting in less classroom stimulation and lower probability of academic success for those left behind. If this is true, then the trend will be self-reinforcing and the share of extended gymnázia should continue to grow over time. It should be noted, however, that this reform was independent of the rise of nonstate schools. Indeed, the division between extended and conventional gymnázia is approximately the same in the state and nonstate

sectors in the Czech Republic, although in Hungary extended academic high schools form a greater fraction of nonstate than state schools.

In addition to these common reforms, there have been major educational reforms that were specific to the Czech Republic since 1989 and need to be taken into account when studying the development of the educational sector since the transition. In particular, one reform adopted in 1995 to take effect in the 1996/97 school year profoundly affected enrollment trends in various types of schools. As discussed above, prior to this time, the ninth year of primary school was optional, with most students opting to enter secondary school after the eighth grade. The main purpose of the ninth grade in primary school was to give students a chance to delay decisions about their educational future (especially if they wished to reapply to secondary schools to which they had been denied admission after the eighth grade) or to provide a stop-gap for students who did not wish to continue their education but completed the eighth grade below the statutory minimum age for employment. By the 1995/96 school year less than 5 percent of students completing the eighth grade continued on to a ninth grade in primary school, down from a high of almost 20 percent a few years earlier. This decline was partially because shrinking overall numbers of students resulting from the demographic trends seen in Table 2, combined with increased opportunities provided by the rise of nonstate secondary schools, reduced the fraction of eighth grade students who were not able to secure admission to their type of desired secondary school. Education law amendments in 1995 rationalized the system by lowering the required years of schooling from ten to nine while making the ninth year of primary school mandatory for all students, increasing the normal age of admission to secondary school by one year.

Because of this change in the length of primary school, the number of students entering secondary school during the 1996/97 school year dropped drastically. Admissions to the high school grades in gymnázia fell from 26,800 in 1995/96 to 15,700 in 1996/97, before rising again to 26,700 in 1997/98. The decline for other types of schools was even greater. Admissions to technical schools fell from 56,400 in 1995/96 to 6,700 in 1996/97, rising back to 56,400 in 1997/98. For vocational schools, the figures were 67,900 in 1995/96, 8,100 in 1996/97 and 53,800 in 1997/98. Gymnazia were able to more successfully maintain enrollment due to the back-log of unsuccessful applicants from previous years, although there has been no investigation of the long-term prospects of this single class of presumably lower than average quality. Given that secondary school is typically a four-year program, this reduced cohort sought university admission in the fall of 2000, when, once again, the small cohort represented an opportunity to reduce the back-log of excess demand created by slot-rationing in previous years.[11]

Finally, in the Czech Republic, there were traditionally a limited number of post-maturita secondary technical schools that typically provided job-specific training to students such as gymnázia graduates who did not seek university entrance but, instead, desired to be prepared for the labor force. Such schools enrolled only about 2,000 new students per year at the start of the 1990s, but had increased enrollment to around 10,000 new entrants per year by the middle of the decade. These programs (typically associated with existing secondary technical schools) were eliminated in the educational reforms of 1995 and replaced by a new

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[11] Although it might have been expected that the number of applicants to university in 2000 would have fallen, in fact the number of applicants increased when compared to the previous year. Given that the number of secondary school graduates in June of 2000 was significantly reduced, this suggests that many applicants denied admission in previous years took advantage of the one-time opportunity to seek entry into highly demanded (and usually over-subscribed) programs. Impacts on the average quality of this class of "rejects" remain to be seen.

type of institution known as a "higher professional school" as well as by a provision allowing students previously served by such post-maturita programs to simply join the third and fourth years of the conventional technical secondary school curricula.[12] Higher professional schools also offered a technical way around the Czech ban on private universities by offering tertiary education under a different name.

The key reform of interest to us remains the rise of private and church schools. Such schools were first legalized in the Czech Republic in 1990. Beginning in 1992, they were funded at a level equal to that provided state schools of the same type in the same area. Under pressure from education authorities, the principle of "equal treatment" for nonstate schools was abandoned in 1995, and the level of support for nonstate schools was set equal to 60 to 90 percent of the subsidy provided to state schools, with the exact amount being set by the Ministry of Education and regional school authorities on the basis of unspecified performance criteria. Dissatisfaction with the arbitrariness of decisions regarding funding levels to nonstate schools resulted in the law being amended again in 1999. Currently, public support for schools is based on a two-part formula. Base support is given according to the level and type of school (e.g. academic, technical or vocational) and is independent of quality or ownership. There is then a supplement that varies according to quality as evaluated by local schools offices (with final determination approved by a board at the Ministry of Education). Nonstate schools can obtain maximum supplements equal to 90 percent of those available to state schools. In addition, the law now limits the discretion of the ministry and

[12]By 1996 there were 165 of the newly formed higher professional schools enrolling between six and eight thousand new students per year. These schools represent a move towards what in other European countries is known as "non-university higher education." Unfortunately, data on such programs are generally hard to come by and we will, in large part, we ignore them in the discussion below.

schools offices when evaluating quality to an explicit set of criteria. This policy was adopted in order to protect nonstate schools from arbitrary denial of funds by public officials.[13]

In Hungary, reflecting the looser form of communism that prevailed during the 1980s, there were actually a limited number of religious-affiliated academic high schools by 1989. In particular, eight Catholic, one Protestant and one Jewish school enrolled over 3,600 students (about 3 percent of those in academic high schools at the time) with full funding from the state. In general these schools served young men who were interested in eventual religious vocations. After the start of the transition, the scope of activity of nonstate schools was expanded and codified. 1990 amendments to the education law provided that "kindergartens, primary and secondary schools." The 1990 Act on Freedom of Conscience and Religion (Chapter 1, section 5) provided "a religious legal entity can provide for any educational activity which is not exclusively reserved for the state." Finally, the 1994 Primary Education law and later rulings by the Constitutional Court established that the basic per student grant (the so-called "normative grant" plus other subsidies for "public duties" fulfilled by nonstate schools must be provided on the same basis as state schools are supported.

Currently, therefore, educational spending in both countries is a function both of the formulae adopted for aid to schools and the total number of students enrolled. The authorities presumably, however, can respond to changes in demand by changing the funding formula in order to keep total spending constant. Table 3 shows the development of public spending over the decade. During the 1990s there were significant variations in public spending on

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[13]The difference in support is somewhat larger than these formulae would suggest since public schools are also eligible for capital funds for construction and maintenance from state sources. During the past decade such investment funds added about 10 percent to the level of support for state schools that was not available to nonstate institutions.

education both in amount per student and in share of the GDP in both the Czech Republic and Hungary. In the Czech Republic spending rose both in constant dollars and as a share of Gross Domestic Product (GDP), until the last years of the decade when it fell somewhat due to reduced cohort sizes and pressure on the state budget when economic growth slowed after 1997. Between 1991 and its peak in 1996, real spending per student increased by at least 37 percent. At the end of the decade it remained 16 percent higher than at the start of transition. Analysis in Hungary is complicated by its significantly greater rate of inflation (635% between 1990 and 1999 as opposed to 290% in the Czech Republic). Filer and Hanousek (2000) have argued that inflation measures in transition economies contain substantial upward biases. If this is true, then real expenditures were substantially greater at the end of the decade than indicated in Table 3 and increased on a per student basis in both countries.

In addition to public spending, those running schools may be able to top up resources from their own funds. In Hungary such fees can be used only for value added services and tuition for fundamental education services is not allowed although "schools always find a legal way to collect money from parents (Aradi, Halász and Nagy, 1998)." Czech private schools generally do charge tuition fees,[14] while church sponsored schools are provided additional funds from congregational or diocesan resources for capital expenditures.

C. Changing Market Incentives

One of the most profound changes during the transition from communism has been a rapid and sustained increase in the value of education. Filer, Jurajda and Plánovský (1999,

[14]In 1998 the mean annual tuition charged by nonstate gymnázia was approximately 15,000 Czech crowns ($450) with a range of from 1,500 crowns to 29,000 crowns. By way of reference, the mean annual wage during this year was approximately 150,000 crowns per worker while most households had at least two workers.

1998) and Munich, Svejnar and Terrell (1999) provide discussions of trends in returns to education in the Czech Republic while Svejnar (1999) contains a summary of research in other countries. Table 4 shows how much more workers who hold various degrees earn than primary school graduates for the entire Czech workforce for various years between 1984 and 1997.[15] Clearly the value of all types of education has been increasing, with the greatest increase occurring for workers with general academic or specialized technical education. The figures in Table 4 are for workers of all ages combined. Results presented in Filer, Jurajda and Plánovský (1998) show that both levels of additional earnings and the increase in these levels associated with various degrees are greater for younger workers, even though many of them were trained under the communist regime. Presumably, the value of education provided after 1989, when curricula were free to adjust to the requirements of the market economy, would be even greater. There is not such exhaustive work on the pattern of wages in Hungary, but findings of existing studies are consistent with the Czech pattern shown in Table 4 (see Paihle 1998 and Varge 1995).

There is one area where economic conditions differed between the Czech Republic and Hungary during the 1990s that may have played a role in the development of the educational system. For most of the decade, unemployment in the Czech Republic was less than 4 percent, rising to a high of between 8 and 9 percent only in 1998 and 1999. In Hungary, by way of contrast, unemployment quickly shot up to almost 14 percent, and fell to around 9 percent only at the end of the decade. Since in both countries, unemployment was

[15] Although often called such in the literature, the results presented are not technically "returns to education" since they show only the private benefit of a given degree and ignore both social returns and the costs associated with that degree Munich et. al (1999) show that these adjustments do not have a substantial impact in the Czech Republic.

greater among the less educated and the young,[16] there should have been a second strong economic incentive to remain in school during the decade. Based on the lack of employment opportunities, we might expect that the push to remain in school would have been greater in Hungary than in the Czech Republic, at least during the first years of the transition.

It would be surprising if individuals did not respond to such massive changes in private pecuniary returns. Indeed, Figure 1 shows that enrollment in secondary school as a fraction of the appropriate age cohort increased throughout the decade in both countries such that by 1998 enrollment was close to 100 percent among 14 to 17 year-old young men and women.[17] In addition, as can be seen in Figure 1, the increase in enrollments was greater in those types of schools where the increase in returns was greatest (see Table 4).

A similar pattern can be seen in the demand for university education. Figure 2 shows the fraction of each cohort applying to and enrolling in university, where the "cohort" is defined as those who turn 18 in a given year. Given the high rejection rate among applicants,[18] and the tendency for rejected applicants to reapply for several years, it is not

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[16]By way of illustration, in 1996, when the overall unemployment rate in Hungary was about 10 percent, the rate for youth 19 or younger was over 25 percent. Those with only primary education had a rate of about 15 percent while the rate for secondary school graduates was about half as large (Keune, 1998). Czech unemployment did not increase substantially until the end of the 199s. In 1999 approximately 8 percent of university graduates were unemployed directly after leaving school, compared with around 13 percent of academic high school graduates, 15 percent of technical school graduates and 20 percent of vocational school graduates (UIV, 2000).

[17]Determination of the enrollment rates for the Czech Republic is complicated by the extension of basic school that occurred in 1996. We have omitted 14 year-olds from the relevant population in 1996 and later. The fact that there is no discontinuity in the trend line in Figure 1 (or any of the later figures) at this point suggests that this is approximately the correct adjustment. He apparent spike in enrollments as a share of cohorts enrolled in school in 1999, however, is likely to be due to the fact that in this year 18 year-old youth should be added into the total cohort numbers. Adding them, however, results in an even larger apparent drop in enrollments. It remains unclear how one should account for the full phase in of this change in the typical length of schooling.

[18]In the mid 1990s roughly 80 percent of Czech gymnázium graduates, 37 percent of technical secondary school graduates and 22 percent of eligible vocational school graduates (i.e. the 8 to 10 percent of vocational school graduates who were enrolled in courses leading to the maturita) were successful in enrolling in university within two years of their graduation from secondary school. Obviously some graduates elect not to apply to university but overall places are still severely rationed.

appropriate, however, to infer that between 60 and 75 percent of eighteen-year-olds actually sought to go to university. It is also the case that the mean number of applications per applicant has been rising over time. In the Czech Republic the average number of applications per applicant increased from 1 (the limit allowed by the communists) in 1989 to 2.2 in 1992, after which it remained roughly constant at 2.45 or less for the remainder of the decade.

D. Growth of Private Schools

Immediately after the collapse of communism, nonstate schools became legal at the primary and secondary level. (Private universities, although allowed from the beginning of the transition in Hungary, were only allowed in the Czech Republic following amendments to the university education law in 1998.) Hungary and the Czech Republic differed in where nonstate school arose. Despite their legality, there has been very little growth of nonstate primary (basic) schools in the Czech Republic. By the 1998/99 school year there were only 33 private and 20 church related primary schools (1.3 percent of the total of 4,093 primary schools in the country), enrolling approximately 0.6 percent of all primary school pupils. Their role has been limited, frequently specializing in marginal students such as those needing special education or not able to adapt to normal school conditions. In Hungary, by way of contrast, in 1999 177 church-affiliated and 87 other primary schools (7.1 percent of the 3696 primary schools in the country) enrolled 5.3 percent of primary school pupils.

At the secondary-school level the story is very different, with nonstate education playing a more important role in the Czech Republic. From a base of zero in 1990, nonstate secondary schools grew to approximately 25 percent of Czech institutions by the middle of the 1990s. Since the average private or church-related school was significantly smaller than the average public school, however, around 13 percent of students were enrolled in nonstate

secondary schools by the middle of the decade. Both the number of schools and the share of students enrolled in them appear to level off by about the 1995/96 academic year and there has been little change (and even a slight decrease) since then. In Hungary, the share of nonstate schools and enrollment rose throughout the decade but by its end had reached only 18 percent of institutions enrolling 10 percent of students.

Table 5 shows the number of state and nonstate secondary schools of various types between 1989/90 and 1999/2000. It is clear that, despite declines in the number of students in the relevant age range, there has not been a commensurate decrease in the number of secondary schools since educational reform began in 1990. Indeed, in the Czech Republic the total number of secondary schools increased by 42 percent from 1246 to 1764, down from a peak of 2116 in the 1995/96 school year.[19] Two-thirds of this increase was accounted for by private schools, which grew from none to 401 institutions by the end of the decade (again down from a peak of 544 institutions three years earlier). Similarly, in Hungary, the total number of institutions increased from 1066 in 1989/90 to 1521 in 1999/2000, with nonstate secondary schools increasing from 10 to 269 during the decade. One implication of this increase, combined with the decline in the number of students in the relevant age range seen in Table 2, is that the average school size fell precipitously over the decade. Even allowing for the fact that a greater share of secondary students have enrolled in academic high schools than in the past, the average state academic high school in the Czech Republic in 1999 was 12 percent smaller than a decade ago, while enrollment in the average technical or vocational

[19]These figures exclude a small number of highly specialized schools such as dance and music academies.

school shrank by over 40 percent.[20] Because institutions tended to retain staff, the falling school size has meant that class sizes have also decreased steadily.

Table 6 shows the total number of students in various types of schools over the decade while Figure 3 shows the share of the secondary-school aged cohort in state and nonstate schools. It is clear that both the fraction of teen-agers enrolled in school and the share of secondary school students in nonstate schools increased dramatically over the decade. From Figure 3 it is obvious that in the Czech Republic the share of the cohort in state schools was approximately the same at the end of the decade as at its start. Thus, the increase in overall enrollment probability over the decade was almost entirely due to the rise of nonstate schools. In Hungary, by way of contrast, enrollment in state schools increased throughout the decade while nonstate schools played a relatively smaller role in enhancing educational opportunities.

Figures 4 through 6 show visually the increase in the share of students in nonstate secondary schools by type of school. There have been similar shifts across the counties away from vocation towards technical and academic high schools. Again, this is in line with the shifting relative wages and unemployment probabilities discussed earlier. What does differ between the Czech Republic and Hungary is the relative importance of nonstate schools of various types. In the Czech Republic nonstate schools have attracted a smaller share of students in academic high schools (9.5 percent), than among technical schools (12.5 percent). In Hungary this pattern is reversed, with nonstate schools having the largest share in academic high schools (14.6 percent) followed by technical high schools (9.2 percent) and vocation schools (6.4 percent).

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[20]This obviously raises questions of over capacity and excess spending on fixed plant. Although there have been attempts to close unneeded public schools, given entrenched bureaucracies and reluctance to commute long distances, these attempts have met with only limited success.

E. Factors Influencing the Establishment of Nonstate Schools

While it is clear that nonstate schools have increased in importance in both the Czech Republic and Hungary since parents sending their children to such schools became eligible for state support (through grants to the schools based on enrollment), perhaps more interesting questions arise with respect to whether the creation of nonstate schools has responded to market incentives, including the perceived lack of quality of public schools, and how the public schools have responded when confronted with competition. These are key issues in the debate over the role of vouchers in the United States from which we may obtain insight from the Central European reforms. A number of results, reported in more detail in Filer and Munich (2000), suggest that market forces have worked, both in determining where nonstate schools have arisen and in the responses of state schools to competition. These results are limited to the Czech Republic because the larger number of Czech districts makes econometric work more practical.

Several factors appear to be associated with whether a nonstate gymnázium was established by 1995 in one of the 77 Czech districts we studied. Among these were the education level of the population, the population density, and the relative size of the secondary school aged population. The critical finding, however, was that nonstate academic high schools were significantly more likely to have been established where the public schools were doing a worse job in meeting their primary mission. Recall that the primary purpose of gymnázia is to prepare students for university admission. When we measure the success of a public school in meeting this mission by whether students from that school do better or worse in obtaining admission to university than would be expected based on the characteristics of

the students and the area in which a school is located,[21] we find that districts where the public schools do worse than they should are significantly more likely to see private academic high schools established in competition with these poorly performing public schools.

We also have strong evidence that nonstate technical high schools in the Czech Republic arise when public schools are not fulfilling their mission. In particular, we find that the proportion of students receiving private schooling in particular subjects is greater in regions where workers with training in these subject are scarcer.[22] We also find that private schooling is more common in regions where there is significant unemployment, thereby indicating that current schools are not providing appropriate training. In contrast, there is absolutely no relationship between these two indicators of labor market demand and the provision of appropriate public school technical training. In short, nonstate schools have created opportunities for training in areas and fields where wages have been growing most rapidly, indicating increasing demand, and where unemployment rates are highest, indicating greater regional mismatch of workers and jobs. Public technical schools, on the other hand, exhibit no such market response. These results are consistent with recent reports that the unemployment rate of graduates from nonstate secondary schools is lower than that of graduates from public schools (UIV, 2000).

Finally, we have some evidence that public schools do respond when confronted by competition. Between 1996 and 1998 state gymnázia in districts where there was no private competition increased the number of personal computers per pupil by 533 percent and

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[21]Although derived independently, the methodology used to assess school quality is similar to that devised by NORC at the University of Chicago for a recent survey of high school quality in the US (U.S. News, 1999).

[22]Where we measure labor scarcity by the extent to which workers in a given region and occupation have had wage increases since the start of transition beyond what would be predicted based on their age, sex, etc.

reduced average class sizes by 1.8 percent. State gymnázia in districts facing the greatest competition (more than 20 percent of local students entering academic high schools enrolling in nonstate alternatives) increased the PC/pupil ratio by 683 percent and reduced class sizes by 3.4 percent. Perhaps the greatest difference can be seen in what we have argued is the true test of the performance of gymnázia, success in gaining university admission for graduates. If we rank districts from 1 to 77 according to the success of graduates from their state gymnázia in obtaining university admission, public gymnázia facing significant competition improved their relative rank by 4.47 positions between 1996 and 1998, while those facing moderate competition improved their ranking by an average of 0.55 positions. Given that there are a fixed number of districts, these improvements came at the expense of state gymnázia in districts where there was no competition from nonstate alternatives. State gymnázia in these districts saw their relative position deteriorate by an average of 1.43 positions.

F. Summary and Conclusions

Post-communist Central Europe provides an interesting laboratory in which to investigate possible responses were a relatively large U.S. state to adopt universal education vouchers. Although public schools were initially relatively good by objective standards, there was an initial surge in initial demand for private alternatives that eventually reached between 10 and 15 percent of the secondary school population. Private schools appear to have arisen in response to distinct market incentives. They are more common in fields where public school inertia has resulted in an under-supply of available slots. They are also more common where the public schools appear to be doing a worse job in their primary educational mission, as seen by the success rate of academic high schools in obtaining admission to the top

universities for their graduates or of technical high schools in obtaining employment and high wages for their graduates. There is also preliminary evidence that public schools facing private competition improve their performance.

Of course these results are at best preliminary and generalizations must be made with caution. Private schools arose in the Czech Republic and Hungary at a time of great turmoil in the educational system and the society in general. There has been a limited time over which to observe the responses of public schools. In summary, however, the preliminary evidence from the adoption of a nation-wide voucher scheme in Central Europe, especially the Czech Republic, supports the claims of advocates for such systems. Private schools supported by vouchers seem to increase educational opportunity and spur public schools to improved performance.

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Table 1
Fraction of Primary and Secondary School Students in Nonstate Schools - 1996/97

Country	% in Nonstate Schools
Central Europe	
Czech Republic	5.0%
Hungary	4.6%
Slovakia	4.6%
Poland	2.0%
Estonia	1.3%
Romania	0.9%
Latvia	0.7%
Bulgaria	0.5%
Slovenia	0.4%
Lithuania	0.2%
EU Comparison Countries	
Netherlands	77.1%
Belgium	58.8%
France	20.6%
Austria	7.4%
United Kingdom	6.5%
Italy	5.7%
Germany	4.7%
EU Total	15.7%

Source: European Commission (1999)

Table 2
Age Structure of the School-Aged Population
(thousands)

	7	8	9	10	11	12	13	14	15	16	17
Czech Republic											
# of Children 1991	133.9	134.5	138.6	141.1	150.4	168.0	174.0	177.2	182.0	187.0	188.6
# of Children 2000	120.2	120.9	128.7	127.9	126.0	129.9	128.3	130.7	133.5	134.2	134.7
Hungary											
# of Children 1991	123.0	129.3	138.1	143.7	154.6	162.9	170.0	178.0	189.4	181.1	150.7
# of Children 2000	119.7	124.9	123.4	120.8	121.5	122.9	124.2	126.1	120.8	122.9	129.1
Poland											
# of Children 1991	679.5	696.6	680.0	651.3	665.7	656.2	644.6	631.2	638.8	623.1	599.6
# of Children 2000	485.5	505.2	536.4	535.3	551.6	574.9	590.3	617.7	657.8	679.5	696.6

Source: National Statistical Yearbooks, Various Years.

Table 3
Public Expenditures on Education

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Czech Republic											
Billions of 1989 crowns*	21.7	21.4	18.1	20.1	23.3	24.9	26.0	27.2	24.2	22.2	22.8
1989 Crowns per Student	8,870	9,050	7,960	8,990	10,490	11,100	11,590	12,190	10,970	10,260	10,940
As Share of GDP	4.0%	4.1%	4.1%	4.5%	5.3%	5.3%	5.2%	5.2%	4.7%	4.4%	4.6%
Hungary											
Billions of 1989 Florints*	86.9	94.8	82.4	91.6	88.4	89.4	77.4	69.1	73.0	74.0	80.4
1989 Florints per Student	39,600	44,100	38,700	43,500	42,500	43,400	37,400	33,400	35,500	36,100	39,300
As Share of GDP	5.0	5.9%	5.7%	6.7%	6.5%	6.4%	5.5%	4.9%	5.0%	4.9%	5.2%

Source: Authors' calculations based on National Statistical Yearbooks, Various Years.

*The exchange rate has varied between 25 and 40 crowns to the dollar over the decade of the 1990s. Hungary has had a much higher inflation rate and several devaluations of th florint. In 1989 the exchange rate was approximately 63 florints to the dollar.

Table 4
Increased Earnings Compared to Primary School Graduates Over Time in the Czech Republic

Level of Education	1984	1993	1995	1997
Academic HS	15%	27%	35%	52%
Technical HS	20%	28%	45%	57%
Vocational HS	n.a.	n.a.	31%	37%
University	40%	60%	92%	125%

Figures for 1984 and 1993 calculated from Chase (1998)
Figures for 1995 and 1997 from Filer, Jurajda and Plánovský (1999)

Table 5a
Secondary Schools by Type, 1989-1998 - Czech Republic

		89/90	90/91	91/92	92/93	93/94	94/95	95/96	96/97	97/98	98/99	99/00
Academic												
	State	225	227	234	244	262	276	282	283	284	277	276
	Nonstate	0	2	24	41	62	72	79	84	82	79	67
Technical												
	State	375	390	564	575	598	677	711	668	653	626	604
	Nonstate	0	4	57	133	222	294	314	333	297	260	232
Vocational												
	State	646	671	663	669	643	638	625	611	574	508	483
	Nonstate	0	0	27	34	84	93	105	127	117	109	102
Total												
	State	1246	1288	1461	1488	1503	1591	1618	1562	1511	1411	1363
	Nonstate	0	6	108	208	368	459	498	544	496	448	401
	% Nonstate	0	0.5%	6.9%	12.3%	19.7%	22.4%	23.5%	25.8%	24.7%	24.1%	22.7%

Table 5b
Secondary Schools by Type, 1989-1998 - Hungary

		89/90	90/91	91/92	92/93	93/94	94/95	95/96	96/97	97/98	98/99	99/00
Academic + Technical*												
	State	665	717	747	772	801	809	832	845	840	855	845
	Nonstate	10**	10*	33	52	65	78	104	135	149	181	209
Vocational + 2-Year												
	State	391	417	526	620	632	618	599	553	497	452	407
	Nonstate	0	0	8	24	28	34	43	52	51	57	60
Total												
	State	1056	1134	1273	1392	1433	1427	1431	1398	1337	1307	1252
	Nonstate	10	10	41	76	93	112	147	187	200	238	269
	% Nonstate	0.9%	0.9%	3.7%	5.2%	6.1%	7.3%	9.3%	11.8%	13.0%	15.4%	17.7%

*Available data does not allow separate identification of academic and technical high schools.

**Estimated from unofficial sources

Source: National Statistical Yearbooks, Various Years.

Table 6a
Enrollment in Secondary Schools by Type, 1989-98 - Czech Republic
(thousands)

		89/90	90/91	91/92	92/93	93/94	94/95	95/96	96/97	97/98	98/99	99/00
Academic												
	State	100.7	101.8	95.9	89.9	80.5	76.6	77.1	66.8	66.4	68.4	72.3
	Nonstate	0	0.1.	0.9	3.5	5.8	8.4	9.2	8.3	7.9	7.4	7.6
Technical												
	State	155.1	161.9	165.0	161.5	164.2	173.4	178.9	142.0	147.4	145.4	140.1
	Nonstate	0	0.2	3.3	10.1	20.5	32.3	37.4	31.5	29.0	23.5	20.1
Vocational												
	State	310.2	301.8	277.4	248.8	237.6	231.9	211.1	139.8	122.4	111.0	145.4
	Nonstate	0	0	0	17.2	27.0	24.3	23.4	15.9	12.7	11.5	14.6
Total												
	State	566.0	565.5	538.3	500.2	482.3	481.9	467.1	348.6	336.2	324.8	357.8
	Nonstate	0	0.3	4.2	30.8	53.3	65.0	70.0	55.7	49.6	42.4	42.3
	% Nonstate	0	0	0.7%	5.8%	10.0%	11.9%	13.0%	13.8%	12.9%	11.5%	10.6%

Figure 1A:
Fraction of Cohort in Various Types of Secondary Schools
(Czech Republic)

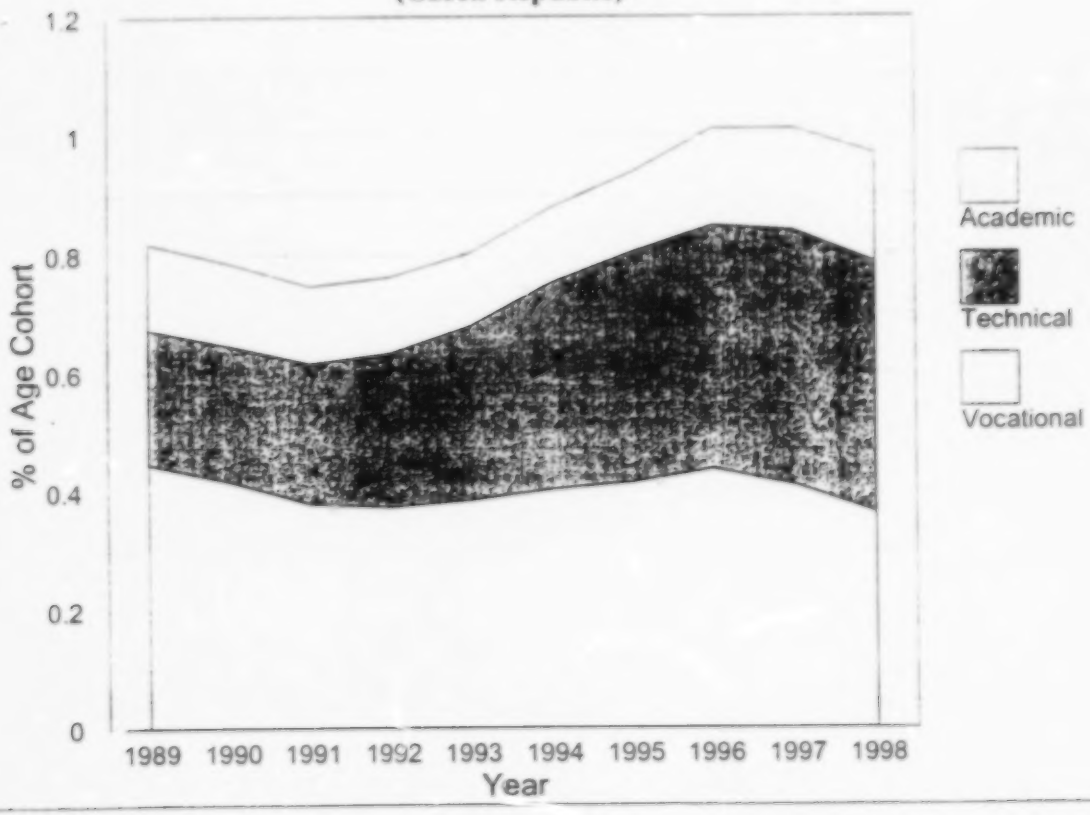

Figure 1B:
Share of Age Cohort in Various Types of Secondary Schools
(Hungary)

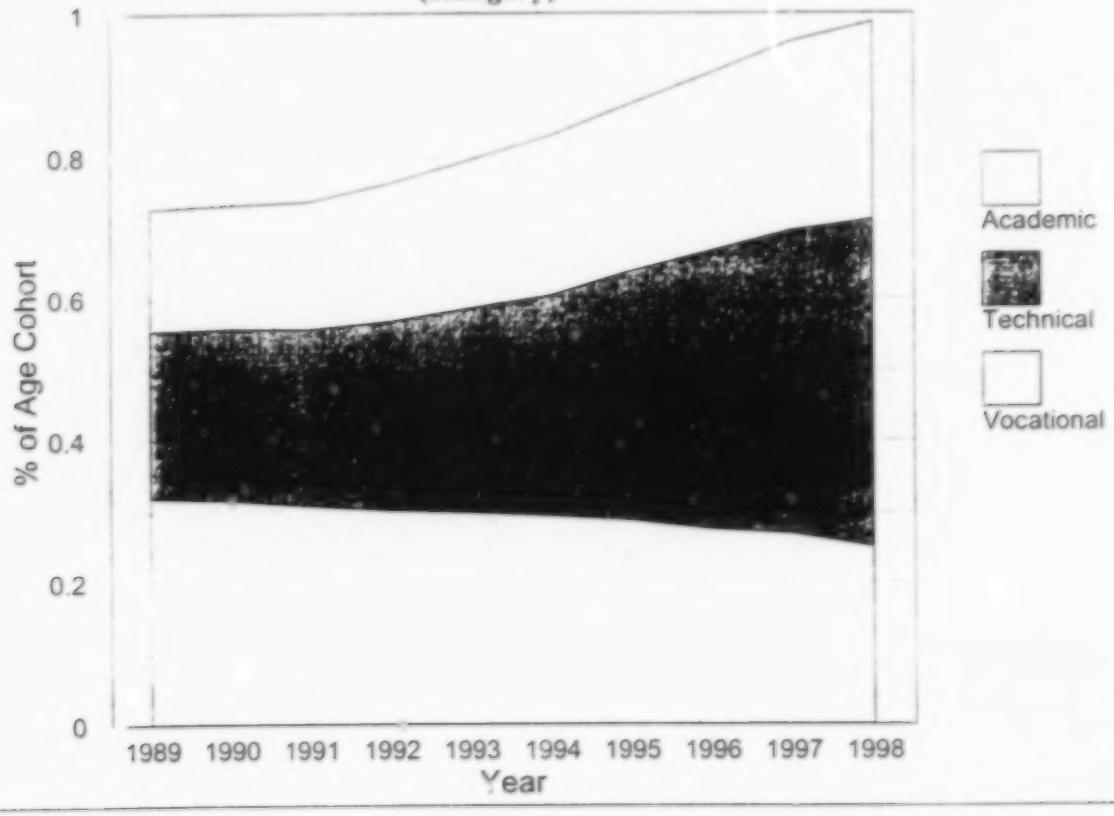

Figure 2A:
Applicants and Admissions to University
(Czech Republic)

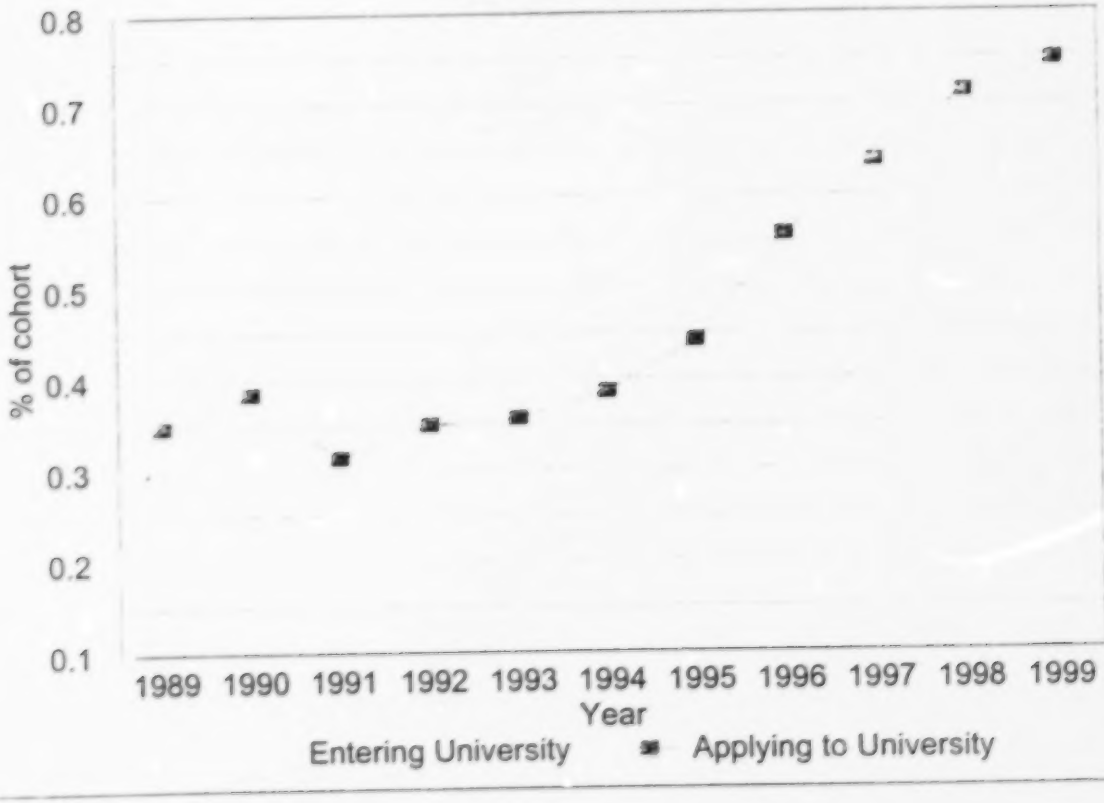

Figure 2B:
Applicants and Admissions to University
(Hungary)

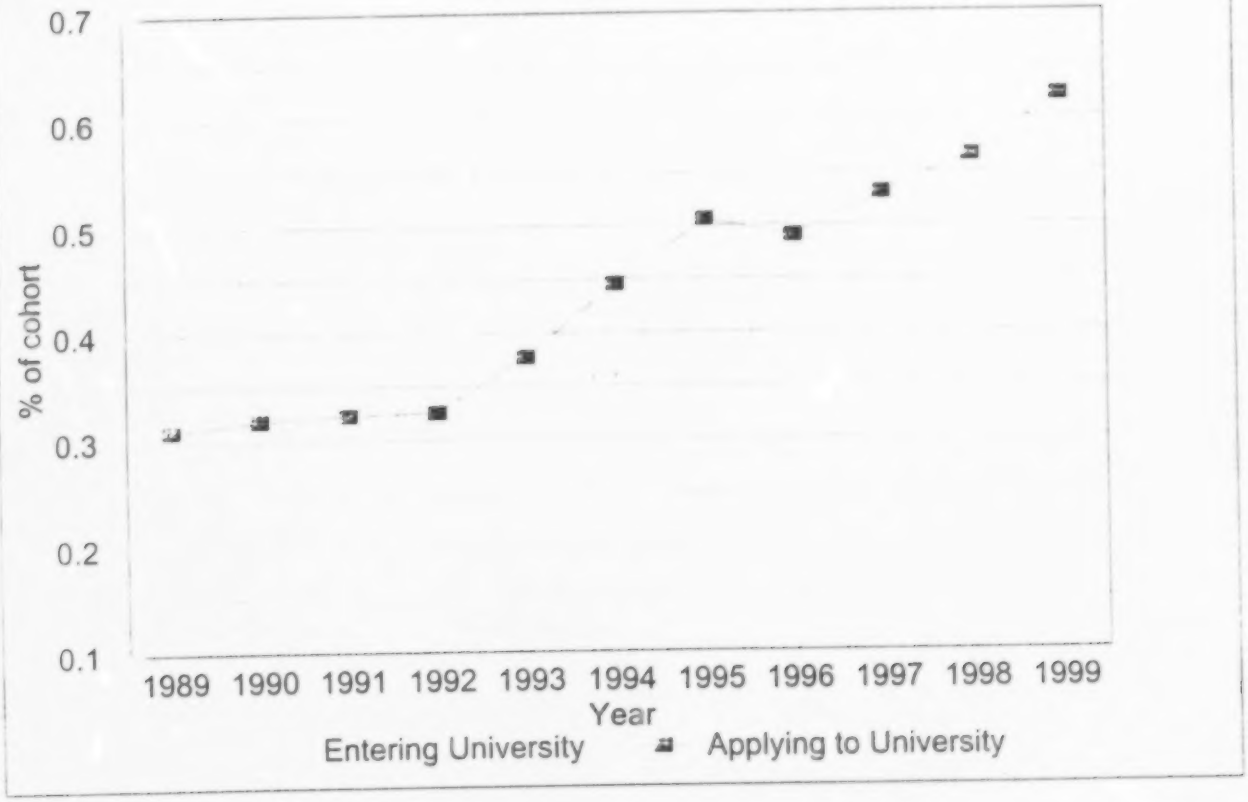

Figure 3A:
Fraction of Cohort Enrolled in Secondary School
(Czech Republic)

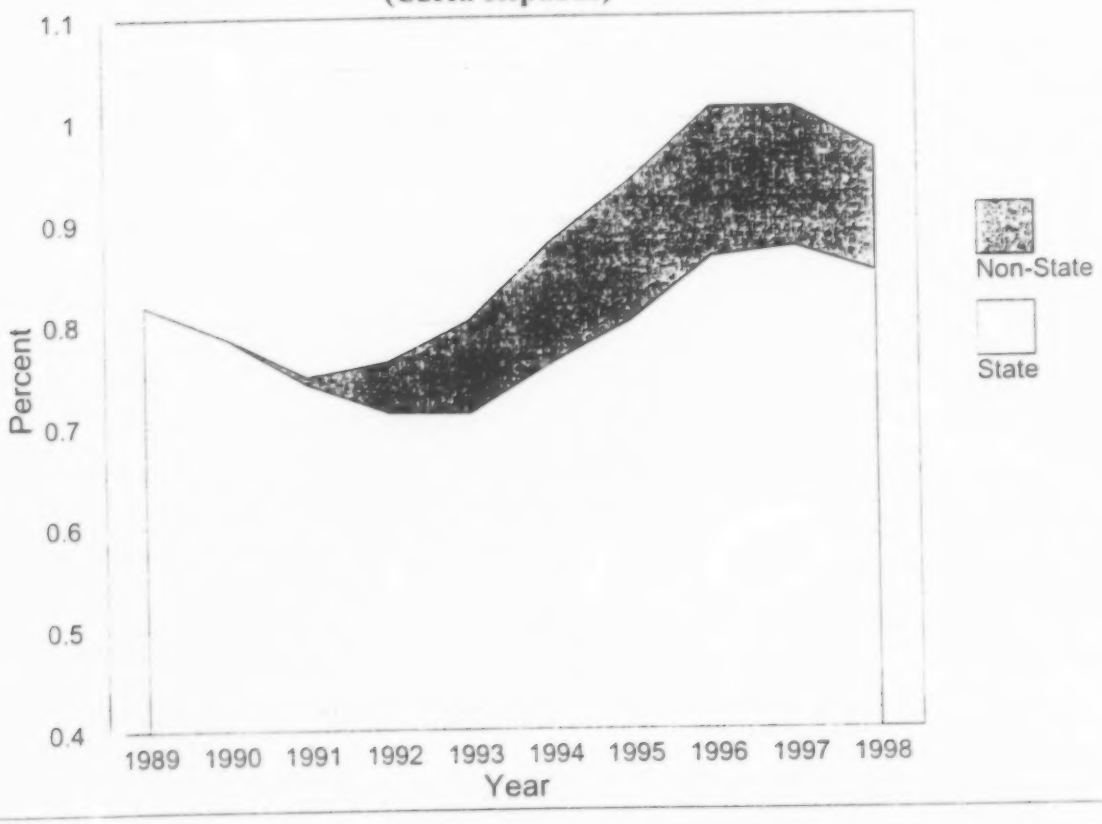

Figure 3B:
Fraction of Cohort Enrolled in Secondary School
(Hungary)

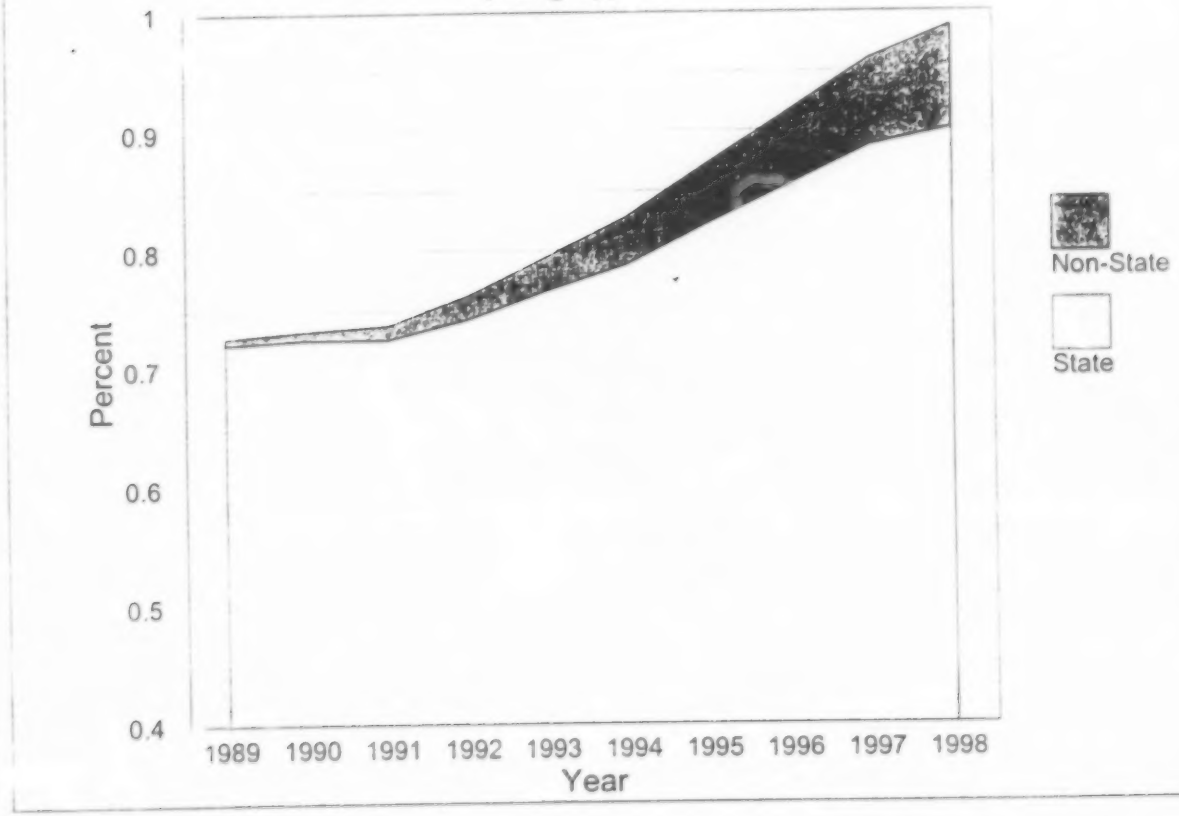

Figure 4A:
Fraction of Cohort in State and Nonstate Academic High Schools
(Czech Republic)

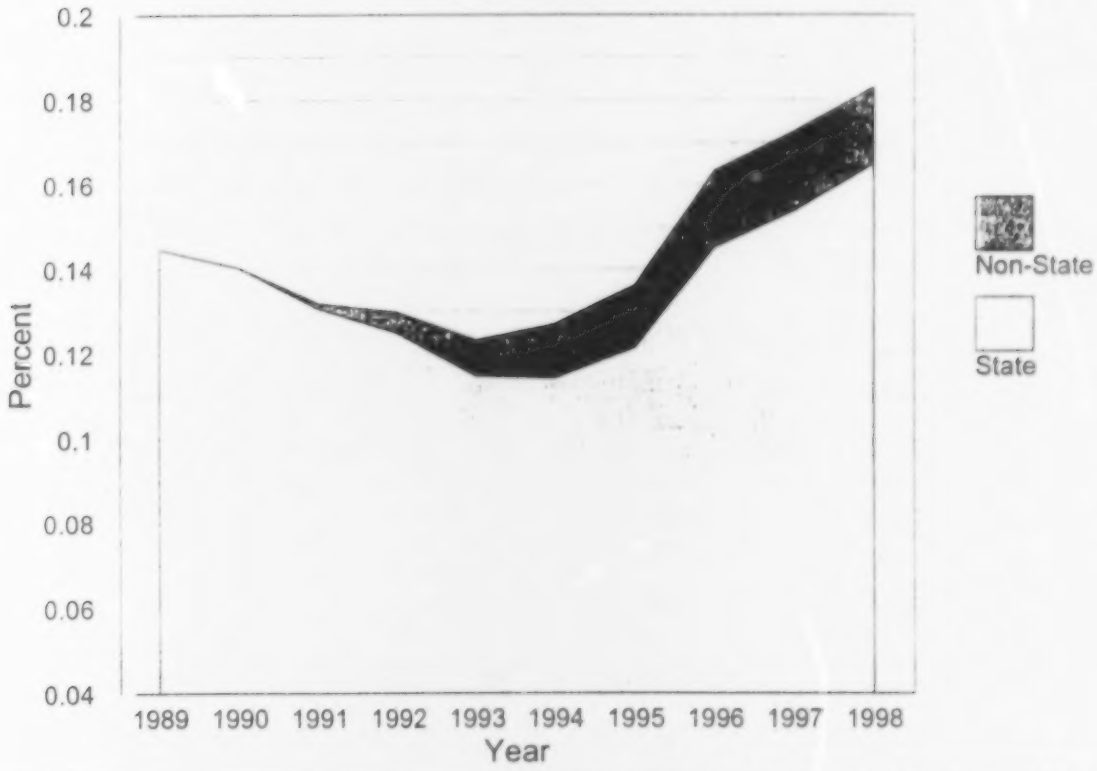

Figure 4B:
Fraction of Cohort in State and Nonstate Academic High Schools
(Hungary)

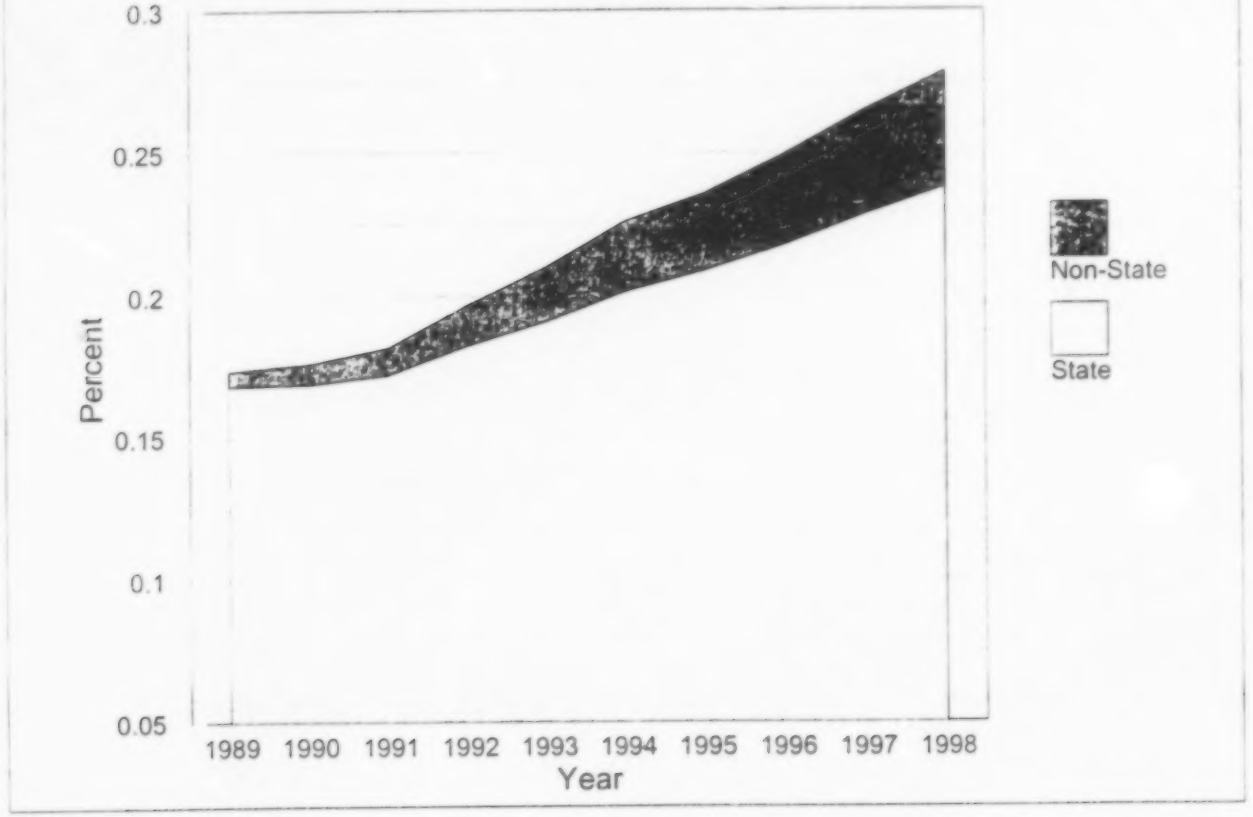

Figure 5A:
Fraction of Cohort in State and Nonstate High Schools
(Czech Republic)

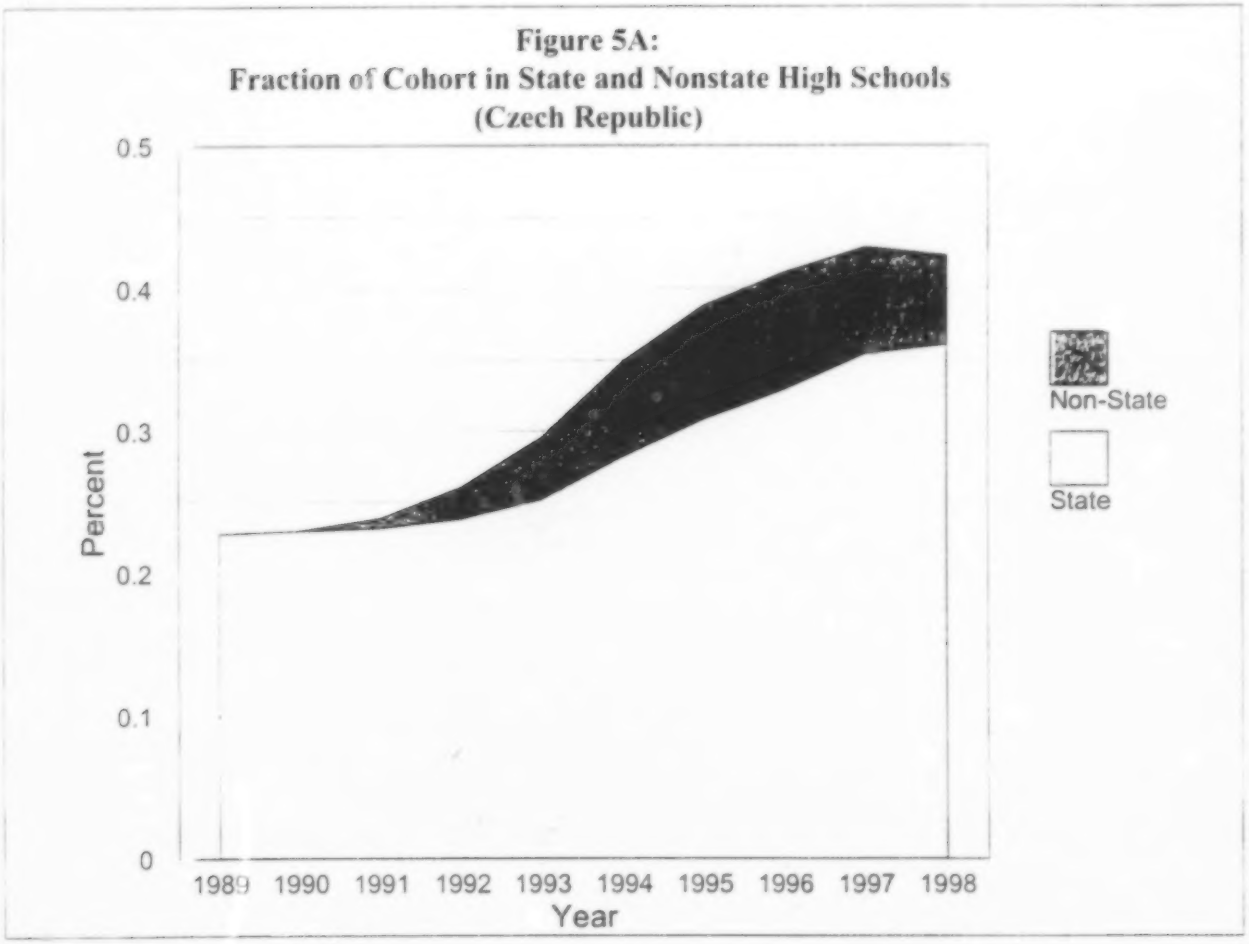

Figure 5B:
Fraction of Cohort in State and Nonstate Technical High Schools (Hungary)

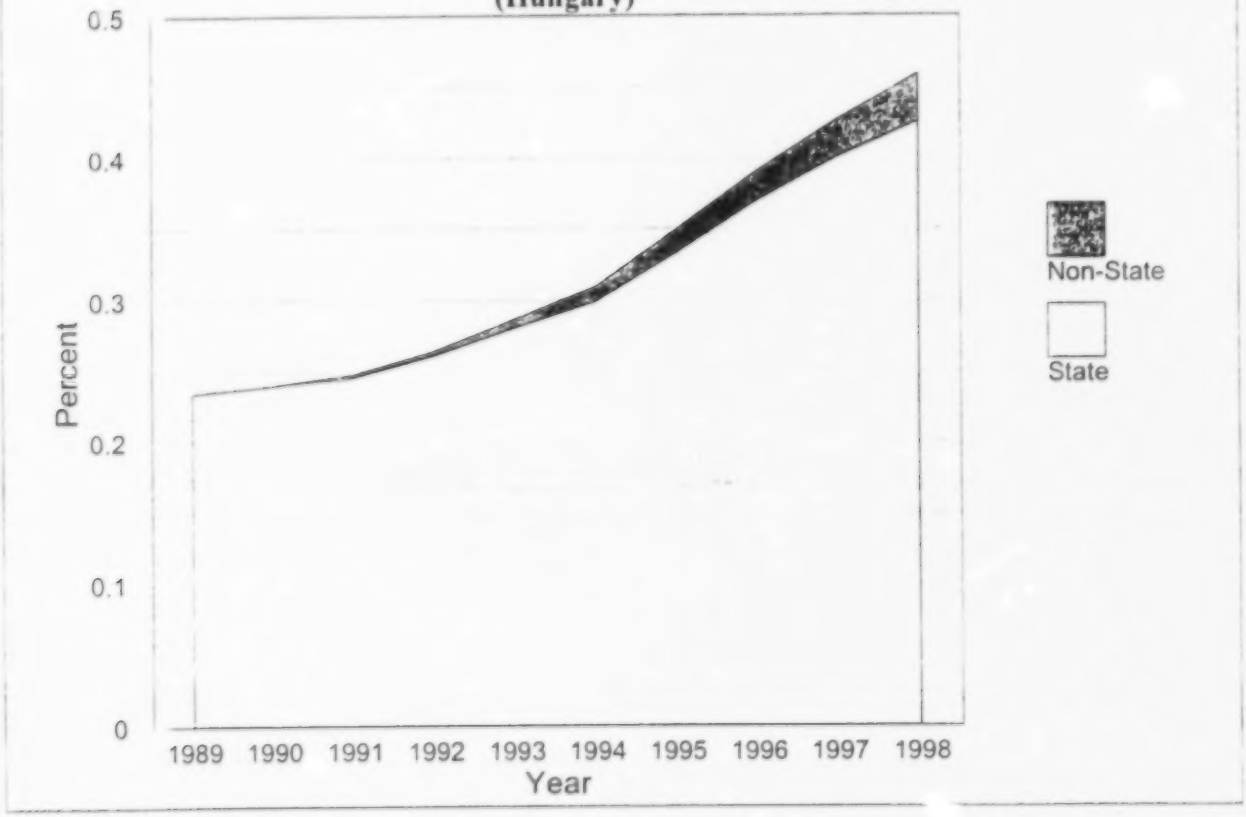

Figure 6A:
Fraction of Cohort in State and Nonstate Vocational Schools
(Czech Republic)

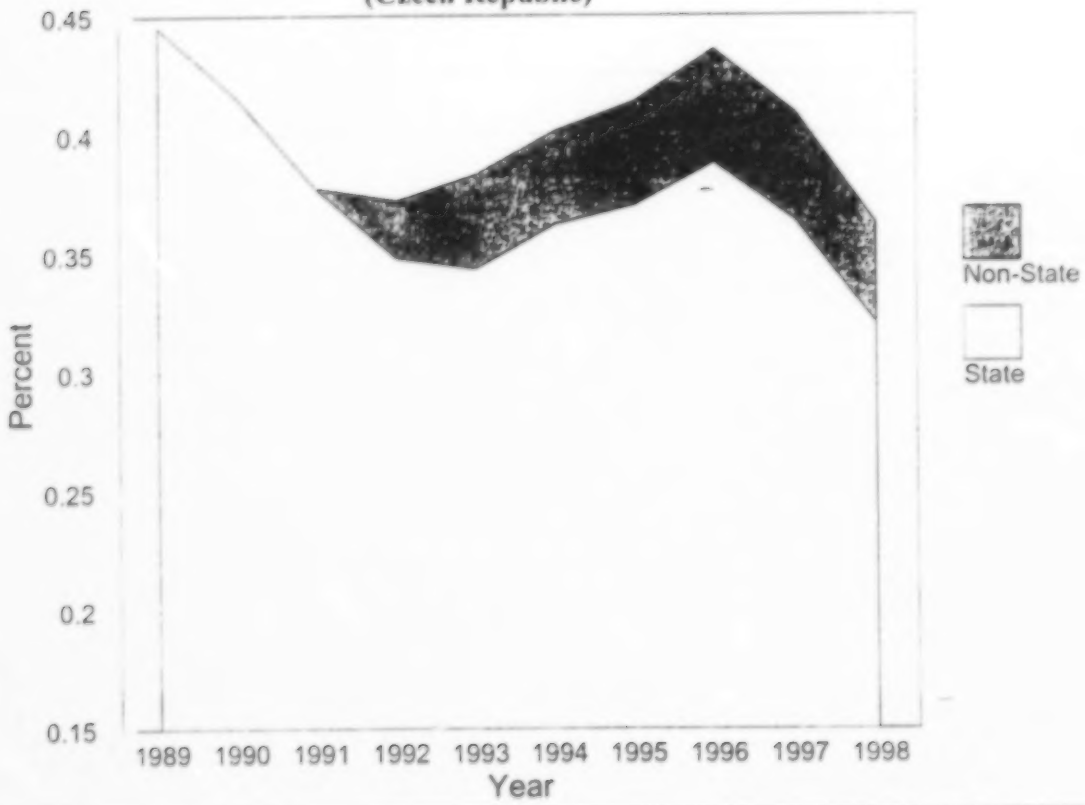

Figure 6B:
Fraction of Cohort in State and Nonstate Vocational Schools
(Hungary)